

CLAIMS:

1. An air bag device for an occupant seated in a rearmost seat of a vehicle, wherein the vehicle has a rear roof rail and a rear window glass, the air bag device comprising:

an air bag accommodated in an upper rear end portion of the vehicle in a folded state; and

an inflator, which supplies gas to the air bag to deploy the air bag,

wherein the air bag has a portion that is unfolded downward to be inflated between the rearmost seat and the rear window glass and a portion that is deployed to cover the rear roof rail.

2. The air bag device according to claim 1, wherein the vehicle has a roof headlining, which covers the rear roof rail, wherein the air bag is accommodated between the rear roof rail and the roof headlining, and wherein, when the air bag is deployed, the air bag separates the roof headlining from the rear roof rail.

3. The air bag device according to claim 2, wherein the vehicle has a roof panel, which is connected to the rear roof rail and is covered by the roof headlining, wherein the air bag has a roof side inflation portion and a passenger compartment side inflation portion, wherein the roof side inflation portion is inflated between the roof panel and the roof headlining, and wherein the passenger compartment side inflation portion is inflated to project toward the passenger compartment from between the rear roof rail and the roof headlining.

4. The air bag device according to claim 3, wherein at least part of the roof side inflation portion

is accommodated between the roof panel and the roof headlining, and when not inflated is in an unfolded state forming a substantially planar surface.

5           5.     The air bag device according to claim 4,  
wherein the roof side inflation portion has at least one  
securing portion secured to the vehicle.

10           6.     The air bag device according to claim 5,  
wherein the securing portion is located at an end of the  
roof side inflation portion, which end extends forward of  
the vehicle.

15           7.     The air bag device according to claim 5,  
wherein the securing portion includes a belt.

20           8.     An air bag device for an occupant seated in a  
rearmost seat of a vehicle, wherein the vehicle has a rear  
window glass and a pair of rear pillars, with a rear  
pillar being located on each side of the rear window glass,  
the air bag device comprising:

an air bag accommodated in an upper rear end portion  
of the vehicle in a folded state; and

25           an inflator, which supplies gas to the air bag to  
deploy the air bag,

wherein the air bag has a portion that is unfolded  
downward to be inflated between the rearmost seat and the  
rear window glass and a portion that is deployed to cover  
the rear pillars.

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9.     An air bag device for occupants seated in  
rearmost seats of a vehicle, the air bag device  
comprising:

35           an air bag accommodated in an upper rear end portion  
of the vehicle in a folded state; and

an inflator, which supplies gas to the air bag to deploy the air bag,

wherein the air bag has a portion that is unfolded downward to be inflated between the rearmost seats and a rear window glass of the vehicle and a portion that is inflated between the rearmost seats.

10. A device for protecting an occupant seated in a rearmost seat of a vehicle, the device comprising:

10 an impact determining device for determining that an impact has been applied to the vehicle or that there is a possibility that an impact will be applied to the vehicle; and

15 a movement restricting mechanism, which functions to restrict the rearward movement of the occupant seated in the rearmost seat based on the determination result of the impact determining device.

11. The device according to claim 10, wherein the movement restricting mechanism includes:

an air bag, which is deployed between the rearmost seat and a rear window glass of the vehicle; and

25 a tension applying mechanism, which applies tension to the air bag, the tension being required for restricting the rearward movement of the occupant seated in the rearmost seat.

12. The device according to claim 11, wherein the non-inflated air bag is accommodated in an upper rear end portion of the vehicle in a folded state, wherein the air bag has tension applying portions on left and right end portions of the air bag, wherein the tension applying portions are coupled to portions of the vehicle in the vicinity of both sides of the rear window glass, and wherein, when the air bag is deployed, the tension

applying portions apply a predetermined tension to the air bag.

13. The device according to claim 10, wherein the  
5 movement restricting mechanism includes at least one of a  
first forward tilting mechanism that tilts a backrest of  
the rearmost seat toward the front of the vehicle, a  
second forward tilting mechanism that tilts a headrest  
located on the backrest toward the front of the vehicle,  
10 and a lifting mechanism that lifts the headrest from the  
backrest.

14. An air bag device for an occupant seated in a  
rearmost seat of a vehicle, the air bag device comprising:  
15 an air bag, wherein the air bag has an upper bag  
portion and a lower bag portion;  
an inflator, which supplies gas to the air bag to  
deploy the air bag between the rearmost seat and a rear  
window glass of the vehicle; and  
20 a thickness restricting mechanism, which restricts  
the thickness of the air bag such that, when the air bag  
is deployed, the thickness of the upper bag portion is  
greater than the thickness of the lower bag portion in the  
front and rear direction of the vehicle.

25 15. The air bag device according to claim 14,  
wherein the thickness restricting mechanism includes a  
closed portion formed by partially joining opposing  
portions of the air bag.

30 16. The air bag device according to claim 15,  
wherein the closed portion is arranged to reduce an  
inflation amount of the lower bag portion to less than an  
inflation amount of the upper bag portion.

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17. The air bag device according to claim 15,  
wherein the closed portion is one of a plurality of closed  
portions extending from the upper bag portion to the lower  
bag portion, and wherein a portion of each closed portion  
5 corresponding to the upper bag portion is narrower than a  
portion of each closed portion corresponding to the lower  
bag portion.

18. The air bag device according to claim 14,  
10 wherein the air bag has a plurality of cells, wherein the  
cells extend from the upper bag portion to the lower bag  
portion, wherein the cells are inflated by gas supplied  
from the inflator, and wherein a portion of each cell  
corresponding to the upper bag portion has a greater  
15 capacity than a portion of each cell corresponding to the  
lower bag portion.

19. The air bag device according to claim 14,  
wherein the air bag has a plurality of cells, which are  
20 inflated by gas supplied from the inflator, and wherein  
the cells corresponding to the upper bag portion have  
greater capacity than the cells corresponding to the lower  
bag portion.

25 20. The air bag device according to claim 14,  
wherein the upper bag portion is deployed at a position  
above the upper end of the rearmost seat.

21. The air bag device according to claim 14,  
30 wherein the lower bag portion has a rigid portion for  
improving flexural rigidity of the lower bag portion when  
the air bag is deployed.

22. The air bag device according to claim 21,  
35 wherein the rigid portion includes a lateral cell, and

wherein the lateral cell extends along the entire width of the lower bag portion and is inflated by gas supplied from the inflator.

5        23. The air bag device according to claim 21,  
wherein the rigid portion includes a dropping inflation  
portion, wherein the dropping inflation portion extends  
lower than the rear window glass and is inflated by gas  
supplied from the inflator.

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24. The air bag device according to claim 14,  
wherein the air bag has side rigid portions on the left  
and right sides of the air bag for improving rigidity of  
the air bag when the air bag is deployed.

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25. The air bag device according to claim 24,  
wherein each side rigid portion includes a vertical  
inflation portion, wherein each vertical inflation portion  
extends in the vertical direction and is inflated by gas  
20 supplied from the inflator.

26. An air bag device for an occupant seated in a  
rearmost seat of a vehicle, the air bag device comprising:  
an air bag;

25        an inflator for supplying gas to the air bag to  
deploy the air bag between the rearmost seat and a rear  
window glass of the vehicle; and

side rigid portions, which extend in the vertical  
direction at the left and right sides of the air bag to  
30 improve the rigidity of the air bag when the air bag is  
deployed.

27. An air bag device for an occupant seated in a  
rearmost seat of a vehicle, the air bag device comprising:

35        an air bag accommodated in an upper rear end portion

of the vehicle in a folded state when the air bag not deployed;

an inflator, which supplies gas to the air bag, wherein, when the gas is supplied to the air bag, the air bag is unfolded downward to be inflated between the rearmost seat and a rear window glass of the vehicle; and

an unfolding direction controlling mechanism for controlling the unfolding direction of the air bag such that the air bag is unfolded along the rear window glass.

28. The air bag device according to claim 27, wherein a rolled portion formed by rolling the non-inflated air bag functions as the unfolding direction controlling mechanism, and wherein, when gas is supplied to the air bag, the air bag is deployed as the rolled portion is unrolled along the rear window glass.

29. The air bag device according to claim 28, wherein, when the rolled portion is unrolled, the rolled portion generates a force to cause the air bag to approach the rear window glass.

30. The air bag device according to claim 27, wherein the unfolding direction controlling mechanism includes a guide mechanism, and wherein, when the air bag is deployed, the guide mechanism guides both sides of the air bag along vertical rims of both sides of the rear window glass.

31. An air bag device for an occupant seated in a rearmost seat of a vehicle, the air bag device comprising: an air bag accommodated in an upper rear end portion of the vehicle in a folded state when the air bag not deployed;

an inflator, which supplies gas to the air bag,

wherein, when the gas is supplied to the air bag, the air bag is unfolded downward to be inflated between the rearmost seat and a rear window glass of the vehicle; and

5 a moving mechanism, wherein, when the air bag is started to be unfolded or before the air bag is unfolded, the moving mechanism moves at least the head of the occupant seated in the rearmost seat toward the front of the vehicle.

10 32. The air bag device according to claim 31, wherein the moving mechanism includes at least one of an advancing mechanism for moving the entire rearmost seat forward of the vehicle, a first forward tilting mechanism for tilting a backrest of the rearmost seat forward of the  
15 vehicle, a second forward tilting mechanism for tilting a headrest located on the backrest forward of the vehicle, and a lifting mechanism for lifting the headrest from the backrest.

20 33. An air bag device for an occupant seated in a rearmost seat of a vehicle, the air bag device comprising:  
an air bag; and  
an inflator, which supplies gas to the air bag to  
deploy the air bag between the rearmost seat and a rear  
25 window glass of the vehicle,

wherein the air bag can be unfolded along the rear window glass in a non-inflated state to be used as a sun shade.